



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/843,836	04/30/2001	Timothy Griffin	033275-212	1029

7590 05/18/2004

Robert S. Swecker  
BURNS, DOANE, SWECKER & MATHIS, L.L.P.  
P.O. Box 1404  
Alexandria, VA 22313-1404

EXAMINER

PRICE, CARL D

ART UNIT	PAPER NUMBER
----------	--------------

3749

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/843,836

Applicant(s)

GRIFFIN ET AL.

Examiner

CARL D. PRICE

Art Unit

3749

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 8-13 and 15-29 is/are pending in the application.
- 4a) Of the above claim(s) 2-4, 12, 13, 15-17 and 20-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 5, 8-11, 18, 19, 24-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **04-21-2004** has been entered.

Applicant's arguments with respect to claims 1,5,8-11,18,19 and 24-29 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's attention is also directed to the newly cited prior art reference of Cornelison (U.S. Patent No.- 5026273 ) which is now relied on to address the limitations of applicant's amended claims. In particular, Cornelison (U.S. Patent No.- 5026273) is relied on to show and/or teach a catalytically operating burner in combination with a gas turbine, and method for operating the burner and turbine in combination, where the catalytic structure is made from includes

Applicant's attention is directed to the newly cited prior art reference of Toyoda (U.S. Patent No. - US005591413A ) which is now relied on to address the limitations of applicant's amended claims. In particular, Toyoda is relied on to show and/or teach a catalytically operating burner, and method for operating the burner where the catalytic structure includes inlet and outlet

Art Unit: 3749

portions (12) having no catalyst carrying layer which is designed for the purpose of preventing breaks and cracks due to thermal strain in the honeycomb structure.

### **Claims**

New claims 25-29 have been added.

Claims 2-4, 12, 13, 15-17 and 20-23 are withdrawn from consideration as being directed to a non-elected specie.

Claims 6, 7 and 14 have been cancelled by applicant.

Claims 1, 5-11, 18, 19 and 24 are under examination.

### **Drawings**

The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 04-21-2004 have been approved by the examiner.

### **35 U.S.C. 112, second paragraph**

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

**Claims 1, 5-11, 18, 19, 24: Rejected Under 35 U.S.C. 112**

Art Unit: 3749

Claims 1, 5-11, 18, 19 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. For example, in claim 1, line 6, the phrase "the fuel/gas mixture or reaction mixture" causes the claim to be indefinite since it is unclear which fluid (i.e. – "fuel/gas", "reaction") can flow through the structure. Also, there is no proper antecedent basis for "the fuel/gas mixture". And, there is no proper antecedent basis for "the reaction mixture".

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1,5,9,10,11,18,19, 24-29: Rejected Under 35 U.S.C. 103**

Claims 1,5,9,10,11,18,19 and 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Cornelison (U.S. Patent No.- 5026273) in view of Toyota (U.S. Patent No.- 5591413).

Cornelison discloses and shows a catalytically operating burner in combination with a gas turbine, and method for operating the burner and turbine (not shown) in combination, where the

Art Unit: 3749

catalytic structure is made from includes. The catalyst in combination with a gas turbine system including fuel injection device and a stabilization zone (32) and turbine are located downstream of the catalyst. The porous screen walls of the Cornelson catalyst define communicating openings that permitting the hot gases from combustion zone flow through and around the meshes (e.g., meshes 50 in FIG. 4) if open, following a tortuous path created by the chevron pattern (note the ) of the corrugations. The catalytic structure (Figure 3; 60,62) of Cornelson is shown divided into a plurality of zones.

Cornelson disclose:

(9) The present invention, on the other hand, utilizes **mixed flow honeycomb cells** characterized by a **nonlinear flow path** and which, by reason thereof, are opaque to infrared radiation while at the same time providing a relatively low pressure drop, diffusing conduit for the combustion gases as they traverse the combustor. **Mixed flow honeycomb cells are cells which provide a tortuous path for the gas to traverse.**

(28) The catalytic combustor unit 40 is shown in greater detail in FIG. 3. Instead of being formed of a cast ceramic monolith as in the past, **the catalyst unit in the present invention is preferably formed of a corrugated screen** of tungsten wire coated with palladium having from 15 to 200 wires per lineal inch uniformly spaced and as illustrated in FIG. 4. As indicated above, the process described in U.S. Pat. No. 4,711,009, supra, is the process of choice for forming and coating the wire screen. The corrugations impressed in the screen are conveniently formed by **corrugation rolls capable of impressing a chevron or herringbone corrugation pattern**. The corrugations have a pitch of from about 0.02" to about 0.2" and an amplitude of from about 0.05" to about 0.25".

(29) The coating 54 is shown in partial diagrammatic form completely blinding the screen 52. As above indicated, the coating 54 need **not completely blind the screen** and may merely coat the individual wires 56, or a combination of both types of coating. The mode of application of the coating 54 to the screen 52 has been detailed above and need not be repeated here.

(30) **FIG. 3 is a fragmentary cross-sectional view of the catalytic combustor of FIG. 2 on an enlarged scale, showing the catalytic zone 40. This zone is built up of a pair of corrugated tungsten wire mesh sections 60 and 62 each formed of a plurality of layers, e.g., layers 64, 66 and 68 in the horizontal mode as shown in FIG. 3. When herringbone corrugated mesh layers, e.g., layers 64, 66, and 68 are disposed as shown, the hot gases from combustion zone 38 flow through the catalytic zone 40 between the layers, if blinded, and through and around the meshes (e.g., meshes 50 in FIG. 4) if open, following a tortuous path created by the chevron pattern of the corrugations.** It will be noted, however, that the straight path followed by infrared light generated in the final combustion zone 70 will be blocked from penetrating the catalyst zone 40 and causing "flashback". In other words, the zone 40 is opaque to light but highly permeable, desirably 70% to 92% open area, for the substantially free passage of gases therethrough.

Art Unit: 3749

(32) **FIG. 5 shows a fragment of a corrugated screen partially coated with a refractory metal oxide.** The wires, e.g., 52 and 56 are woven in a standard over-an-under weave and define meshes 50. The metal oxide coating 54 in the embodiment shown, blinds or fills the meshes 50. Although blinding of the screen is not necessary and the meshes 50 may be partially open. The pitch "p" of the corrugations is identified by the letter "p" and the altitude by the letter "a". The dimensions of these parameters are as given above. It should also be noted in FIG. 5 that the corrugations are in **a chevron pattern or a herringbone pattern** which is a well known configuration **for foil strip catalytic supports.** The present catalytic supports are screen instead of gas impermeable foil such as described in U.S. Pat. No. 4,711,009.

Toyoda teaches, from the same catalytic reactor field of endeavor as Cornelison, a catalytically operating structure, and method for operating the structure where the catalytic structure includes inlet and outlet portions (12) having no catalyst carrying layer, a catalytic structure (11) being located between the inlet and outlet portions, which is designed for the purpose of preventing breaks and cracks due to thermal strain in the honeycomb structure.

Toyoda discloses"

- 1) (10) As described hereinabove, because the first **honeycomb structure 11** uses sheet material that has been **pretreated with a catalyst-carrying layer** and does not use brazing filler metal, a greater concentration of air passages can be achieved than when using brazing filler metal, thereby resulting in an improvement of catalytic efficiency and, because thermal strain due to heat generated by catalytic reaction and exhaust gas heat can be eased, an improvement in durability. **The second honeycomb structures 12** are bonded by brazing filler metal, but because these honeycomb structures are made with a smaller concentration of air passages, resistance to the passage of exhaust gas is reduced, and moreover, **a stream line flow effect is added, thereby improving catalytic efficiency in the first honeycomb structure.** In addition, **because no catalyst-carrying layer is applied,** no heat is generated by catalytic reaction, and durability can therefore be improved due to the reduction of thermal strain.

Cornelison discloses the invention substantially as set forth in the claims with possible exception to the use of the catalytic structure including inlet and outlet portions (12) having no catalyst carrying layer.

Art Unit: 3749

In regard to claims 1,5,9,10,11,18,19 and 24-29, it would have been obvious to a person having ordinary skill in the art to, for the purpose of preventing breaks and cracks due to thermal strain in the honeycomb structure, to modify the catalytic structure of Cornelison to include inlet and outlet portions having no catalyst carrying layer therefore providing at least some of the channels having at least one catalytically active zone (i.e. – along the intermediate catalyst 60, 62) and at least two catalytically inactive or inert zones (i.e. – at the inlet and outlets, respectively) in the flow direction, in view of the teaching of Toyota. In regard to claims 26 and 29, since the degree of catalytic activity in a reactor of the type disclosed in Cornelison is necessarily related to the amount of catalytic material applied along the reactor flow passages, to leave one of the partial zones (60,62) uncoated or catalytically inactive, in the manner set forth in applicant's claims, can be viewed as nothing more than a mere matter of choice in design, absent the showing of any new or unexpected results produced therefrom over the prior art of record.

**Claims 6-8: rejected under 35 U.S.C. 103(a)**

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over in view of Cornelison (U.S. Patent No.- 5026273) in view of Toyota (U.S. Patent No.- 5591413), as applied to claims 1 and 24 above, and further in view of Dalla Betta et al (US 5248251) and Betta et al (US 5512250).



Art Unit: 3749

Cornelison (U.S. Patent No.- 5026273) shows and discloses the invention as set forth in the claims. However, Cornelison (U.S. Patent No.- 5026273) does not disclose inactive and active channels, or zones, as set forth in applicant's claims 6-8.

Dalla Betta et al and Betta et al both teach, from the same catalytic structure field of endeavor as EP '117 and US '832, providing different catalytic activity zones (see Dalla Betta et al; figure 2c) and active and inactive channels (see Betta et al; figures 1-7) for the purpose of defining reaction area in order to active a desired overall effect on the gases in the structure.

In regard to claims 6-8, for the purpose of defining reaction area in order to active a desired overall effect on the gases in the structure, it would have been obvious to a person having ordinary skill in the art to modify the catalytic structure Cornelison (U.S. Patent No.- 5026273), to include inactive and active coated channels, or zones, as set forth in applicants claims, in view of the teachings of Dalla Betta et and Betta et al.

### **Conclusion**

See the attached PTO FORM 892 for prior art made of record and not relied upon and which are considered pertinent to applicant's disclosure.

***USPTO CUSTOMER CONTACT INFORMATION***

Art Unit: 3749

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CARL D. PRICE whose telephone number is 703-308-1953. The examiner can normally be reached on Monday through Friday between 6:30am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ira Lazarus can be reached on 703-308-1935. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Carl D. Price', is positioned above the printed name.

CARL D. PRICE  
Primary Examiner  
Art Unit 3749

CP